

### **ABSTRACT**

An apparatus and method for detecting gear features is provided. The apparatus includes a magnetic-sensing element, a thresholding module, and an output module. The magnetic-sensing element may provide a sensor-output signal indicative of the presence  
5 of a gear feature.

The thresholding module may (i) transform the sensor-output signal into a characteristic waveform, which is also indicative of the presence of the gear feature; (ii) detect a first difference between the characteristic waveform and a reference signal, and responsively provide a tracking signal that tracks this difference; and (iii) detect a second  
10 difference between the tracking and reference signals, and responsively adjust the sensor-output signal.

Adjustment may be performed (i) as a function of the second difference when it falls below a given threshold and (ii) by a predetermined amount when the second difference satisfies the given threshold. The output module may produce an output signal  
15 as a function of the characteristic waveform and the reference signals.